

KamLAND Phase 0 Z-axis deployment procedure.

All calibration source deployments and glove box uses including purging, deployments, source changes, etc. are to be logged in the glove box logbook and electronic logbook. Relevant parameters such as dates, times, calibration source, dome air radon concentration, etc. should be noted.

Arrange for the deployment beforehand. Get approval from the local supervisors and discuss during the scheduling meeting. All of the sources that will be deployed must be certified (by having been tested for radiopurity and scintillator compatibility and pressure tested if necessary) before use. Read the all of the relevant documentation before proceeding. Only certified operators are authorized operate the deployment and gas handling equipment. Any non-standard deployments must be approved in advance by the local supervisors.

Initial Setup.

1. If necessary, clean and prepare the source to be deployed (not required if the source is already cleaned and/or in the glove box). Follow the cleaning protocol set up by Mitsuko.
2. If necessary, open the glove box and insert the clean source through the transfer box doors according to the procedure (Changing a source.) given in the glove box gas procedure.
3. Attach the source to the source rod by screwing the attachment nut of the source onto the threaded end of the deployment rod. After the source nut is screwed in to the full depth of the threads, slowly turn the source nut in the unscrew direction until the flat keys on the source nut and the deployment rod are lined up. Then insert the stainless steel pin and lock the pin. The source is now attached and ready to begin deployment.
4. Purge the glove box with nitrogen according to the glove box purging procedure.

Deployment.

1. Make appropriate entries in log.
2. Remove the cover from the deployment hole in the glove box.
3. Manually (or by computer control) lower the source until the rod/source assembly is in the flange stack and the slotted deployment hole cover plate can be installed.
4. Install the slotted cover plate.
5. Install the light shields and turn off the light inside the glove box.
6. Equalize the pressure between the glove box and the detector and open the 16" gate valve as per the instructions given in the glove box gas procedures. When the source is deployed, the motor power to the 16" gate valve should be unplugged.
7. Using computer or manual control, deploy the source to the position(s) desired according to the instructions for the software and manual control box.

8. After calibration is finished, retract source to 30 cm below home position.
9. Use a red light source and look into the glove box. Manually raise the source until it touches the slotted cover plate.
10. Reconnect the power cable and close the 16" gate valve.
11. Remove the slotted cover plate and raise the source to its home (fully retracted with limit switch tripped) position.
12. Install the solid cover plate over the deployment hole.
13. The system is now secure. The source may be removed if desired using the reverse of steps given in the Initial Setup section.

Compatibility with other deployment systems

The use of other deployment systems is not precluded by having the phase 0 deployment system in place. If desired, manual deployments with both the LSU fiber deployment system and the hand crank system are possible.